



Big Data Task Force Update

NAC Science Committee

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NASA Science Mission Directorate

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Ad Hoc Task Force on Big Data

- Created via NAC Charter part 13.1.vi (April 2014), will report to NAC Science Committee (SC)
- Motivations:
 - Catalogue best practices within NASA, other Federal agencies, private industry, research institutions
 - Enable interoperable data sets to facilitate potentially new science, better use of data for decision support and potentially actionable science information
- Membership: individuals from industry, academia, independent researchers, and government institutions with backgrounds in utilization or administration of large-scale data archives
 - 1 Chair (cyber-infrastructure specialization)
 - 1 Aeronautics rep
 - 2 Industry reps (experience with NASA and big data)
 - 6 Discipline reps (2 each Earth Science and Heliophysics, 1 each Astrophysics and Planetary Science)

Terms of Reference

NASA ADVISORY COUNCIL

SCIENCE COMMITTEE

AD HOC TASK FORCE ON BIG DATA

TERMS OF REFERENCE

The Ad Hoc Task Force on Big Data (hereinafter, "Task Force") is an ad hoc task force of the NASA Advisory Council's (NAC) Science Committee supporting the advisory needs of the NASA Administrator, the NASA Science Mission Directorate, the other NASA Mission Directorates, and the NASA Chief Information Officer, as required. The scope of the Task Force includes all NASA Big Data programs, projects, missions, and activities. The Task Force will focus on such topics as exploring the existing and planned evolution of NASA's science data cyber-infrastructure that supports broad access to data repositories for NASA Science Mission Directorate missions; best practices within NASA, other Federal agencies, private industry and research institutions; and Federal initiatives related to big data and data access.

Per NASA Policy Directive (NPD) 1150.11, *Federal Advisory Committee Act Committees*, the Task Force will be managed under procedures that ensure the same spirit of openness and public accountability that is embodied by the Federal Advisory Committee Act (FACA). This includes public meetings as appropriate and public access to Task Force records.

MEMBERSHIP

The membership of the Task Force will consist of leading authorities with relevant expertise drawn from industry, academia, independent researchers, and Government institutions. The Associate Administrator for Science Mission Directorate, after consultation with the Administrator, will appoint the Task Force Chair and the members. Appointments will be for a limited duration not to exceed a two-year term, to be determined by the Associate Administrator for Science Mission Directorate in consultation with the NASA Administrator. The Task Force Chair, in consultation with the Science Committee Chair, will select a Vice Chair from among the members of the Task Force. The Task Force will have between five to ten members.

MEETINGS

The Task Force will meet approximately three times a year, usually in advance of the Science Committee meetings. Task Force meeting agendas will be approved pursuant to NPD 1150.11, by the Task Force Executive Secretary, after coordination with the Task Force Chair, and will be responsive to requests from the Administrator, the Associate Administrator for Science Mission Directorate, and the Council Chair. The Task Force Chair is not a Science Committee member but does report on activities of the Task Force at Science Committee meetings, upon the invitation of the Science Committee Chair. Recommendations of the Task Force shall be transmitted to the Science Committee and the NAC in the same way as subcommittee recommendations under the NAC Charter. In the event of a necessary absence by the Task Force Chair, the Vice Chair will represent the Task Force in the Science Committee meeting. The Vice Chair is not a member of the Science Committee. The Task Force Executive Secretary will publish notices of upcoming Task Force meetings in the Federal Register at least 15 days prior to each meeting.

REPORTING


As appropriate, the Task Force Chair will report on the Task Force's findings and draft recommendations to the Science Committee at the Science Committee's public meetings, for deliberation. Records of each Task Force meeting, including meeting agenda, list of attendees, minutes, and presentations, will be kept by the Task Force Executive Secretary. The meeting agendas, presentations and minutes from Task Force public meetings will be posted to the Science Committee website for public access. After certification of the minutes by the Task Force Chair and Task Force Executive Secretary (not to exceed 90 days following the meeting), the minutes will be posted to the Science Committee website. In addition, the Task Force Executive Secretary will keep detailed financial records, member appointment records, and other pertinent records throughout the year, and provide annual summary input on the Task Force activities to the Science Committee Executive Secretary for NASA's required annual fiscal year report on its FACA advisory committees to the General Services Administration (i.e., FACA Database). The Task Force Executive Secretary will also coordinate with the members to ensure that all legal/ethics requirements pertaining to Special Government Employee appointments are met. The requirements include, but are not limited to, timely filing of annual financial disclosure reports and annual ethics training by a representative of NASA's Office of General Counsel (OGC), and seeking advice from the NASA OGC Ethics Team for any questions concerning Government ethics requirements that may arise.

ADMINISTRATIVE PROVISIONS

The Task Force Executive Secretary will be appointed by the Associate Administrator for Science Mission Directorate, following coordination with the Science Committee Executive Secretary and Council Executive Director. The Task Force Executive Secretary will work with the Task Force Chair to coordinate meetings, agendas, speakers, etc. for Task Force meetings. Staff support and travel funds for the Task Force Chair and members will be provided by the Science Mission Directorate. Other NASA Mission Directorates may provide support for specific activities, as appropriate.

DURATION

The Task Force Terms of Reference will terminate at the discretion of the Administrator, or at the end of two years from the date of signature noted below, whichever comes first. If the Council's Charter is terminated or expires, the Task Force will terminate. If the Task Force terminates, the Task Force terms of reference also terminate, and all appointments to the Task Force terminate.


Charles F. Bolden, Jr.
NASA Administrator

1/8/2015
Date

Formation

- Status:
 - Terms of Reference signed
 - Nominees: 8 cleared to serve and pending appointment; 2 in clearance process
 - Executive Secretary: Dr. Erin Smith, NASA Ames (on detail to HQ)
 - Chair-nominee engaged and drafting ideas
 - First telecon meeting within next few months
- Challenges:
 - Large data sets demand understanding of architecture and tools for current and future needs
 - Definitions: “Big Data” means different things to different groups

NAC SC Requests Feedback

- NAC SC at its July 2015 meeting asked the Subcommittees to discuss and provide feedback on the charge of the Task Force
- Presentations and discussion occurred at the 4 Subcommittee meetings held since then (HPS, PSS, APS, ESS)
- Question posed:

Regarding the Ad Hoc Big Data Task Force (BDTF), what would your Subcommittee like to see as the task force's

- 1) Needs Statement – the need or problem the task force is addressing
- 2) Goal
- 3) Objectives
- 4) Tasks
- 5) Deliverables

Subcommittee Feedback: BDTF Linkages/Dialogues

- Link with existing efforts on big data (e.g. Planetary Data System workshops, virtual astronomy model, STScI work, LSST work, National Climate Assessment data online, Community Coordinated Modeling Center).
- Invite persons involved in those efforts to participate (data system managers, modelers, simulation experts, industry working with NASA Ames, NASA archives people)
- Important to leverage with industry partners, and learn methods from universities and government science centers

Subcommittee Feedback: BDTF should Assess/Inform

- Within-discipline - Understand big data first within subfields of discipline and ascertain if there is leveraging/cooperating. Big Data Task Force could facilitate identification of within-discipline synergies, needs and gaps.
- Cross-pollination - Inform and learn across disciplines/NASA SMD divisions/Federal agencies as *big data is happening in all sciences*. Big Data Task Force could facilitate the exchange of knowledge of how different practices and tools are used, insights, developments and lessons learned.

Task/Deliverable: Big Data Task Force could identify the best way to gather data on big data needs and activities and have a feedback mechanism so the Subcommittees and disciplines benefit from this effort (e.g. survey to industry members, AAS town hall)

Subcommittee Feedback: Big Data Aspects to Address

Usability of Data, Datasets and Databases

- Management and Access
- Utilization
- Interoperability (e.g. integration of heterogeneous datasets, harmonization of data with different timeframes)

Analysis

- Data mining/analysis of large datasets
- Algorithm and statistics development

Storage

- Data curation
- Archiving tools and technology

Visualization (e.g. hyperwall)

Utilizing State-of-the-Art IT Systems and Tools